

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Application of Space Exploration Holdings, LLC ) File No. SAT-MOD-20181108-00083  
For Modification of Authorization for the )  
SpaceX NGSO Satellite System )

To: The International Bureau

**PETITION TO DEFER**

Spire Global, Inc. (“Spire”) hereby submits this petition to defer the above-referenced application of Space Exploration Holdings, LLC (“SpaceX”) seeking, *inter alia*, authorization to relocate 1,584 satellites from their currently authorized altitude of 1,150 km to the requested altitude of 550 km (the “Proposed LEO Orbit”),<sup>1</sup> which is at or near the operating orbital altitudes of Spire LEMUR-2 satellites, as well as those of many non-geostationary orbit satellite systems (“NGSOs”).<sup>2</sup> As explained in the Commercial Smallsat Spectrum Management Association (“CSSMA”) Comments and Petition to Defer,<sup>3</sup> SpaceX has failed to provide a

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<sup>1</sup> Application of Space Exploration Holdings for Modification of Authorization for the SpaceX NGSO Satellite System, File No. SAT-MOD-20181108-0008 (filed Nov. 8, 2018) (“SpaceX Modification”).

<sup>2</sup> See Stamp Grant, Spire Global, Inc., IBFS File No. SAT-AMD-20161114-00107 (granted in part and deferred in part Apr. 7, 2017); Stamp Grant, Spire Global, Inc., IBFS File No. SAT-AMD-20161114-00107 (granted in part and deferred in part May 18, 2017); Stamp Grant, Spire Global, Inc., IBFS File No. SAT-AMD-20161114-00107 (granted in part and deferred in part July 13, 2017); Stamp Grant, Spire Global, Inc., IBFS File No. SAT-AMD-20180102-00001 (granted in part and deferred in part Nov. 28, 2018); see also Commercial Smallsat Spectrum Management Association, Comments and Petition to Defer, File No. SAT-MOD-20181108-0008, at 3-4 (filed Jan. 29, 2019) (describing other systems that operate or will operate in the 400-600 km orbital range) (“CSSMA Comments”).

<sup>3</sup> See CSSMA Comments, Technical Annex at 1-2. Spire supports the CSSMA Comments, including the accompanying Technical Annex, and hereby incorporates by reference those documents.

detailed collision risk analysis, as required by the FCC’s rules, even though it is proposing to operate in “identical” or “very similar” low-Earth orbits as other constellations.<sup>4</sup>

Accordingly, the International Bureau (“Bureau”) should defer action on the SpaceX Modification until SpaceX provides the detailed collision risk analysis sufficient for others, such as Spire, to evaluate the risk and impact to their respective systems. As explained in the CSSMA Comments, the increase in the number of satellites in the area and the larger mass and cross-sectional area of SpaceX’s satellites<sup>5</sup> may require that Spire execute more differential drag maneuvers in response to potential conjunction events, resulting in a significant capacity loss and imposing an extraordinary burden on Spire whose satellites are not operational during those maneuvers.<sup>6</sup> Moreover, as explained in the CSSMA Comments, deferring action on the application is appropriate because the SpaceX Modification raises significant policy issues<sup>7</sup> that are likely to be addressed in the Commission’s pending proceeding, as well potential proceedings of other federal agencies, on the mitigation of orbital debris.<sup>8</sup>

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<sup>4</sup> 47 C.F.R. § 25.114(d)(14)(iii); *see also Mitigation of Orbital Debris*, Second Report and Order, 19 FCC Rcd 11567 ¶ 50 (2004). Indeed, SpaceX fails to acknowledge that there may be operators at or near the Proposed LEO Orbit, other than Spire and Kepler Communications, Inc., with which SpaceX states it will coordinate. *See* SpaceX Modification, Attachment A Technical Information to Supplement Schedule S at 44.

<sup>5</sup> Each SpaceX satellite is expected to have a mass of approximately 386 kg or approximately 80x the mass of a typical 3U cubesat. *See* Application of Space Exploration Holdings, LLC for Authority to Launch and Operate an NGSO Satellite System, File No. SAT-LOA-20161115-00118, Attachment A at 54 (Nov. 15, 2016).

<sup>6</sup> *See* CSSMA Comments at 4-5, n.15. Most of those smallsats lack propulsion capability or have limited propulsion capabilities necessary to accommodate the SpaceX Modification. As explained in the CSSMA Comments, even those satellites capable of executing differential drag maneuvers in response to potential conjunction events will experience substantial capacity loss because they are not operational during those maneuvers. *Id.*

<sup>7</sup> *See id.* at 5-6 (discussing the unanswered policy questions raised by the SpaceX Modification).

<sup>8</sup> *See, e.g., Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rule Making, IB Docket No. 18-313 ¶ 98 (Oct. 25, 2018); *Licensing Private Remote Sensing Space Systems*, Advance Notice of Proposed Rulemaking, 83 FR 30592, 30594 (June 29, 2018) (seeking

In the alternative, Spire requests that the Bureau condition any grant of the SpaceX Modification upon: (i) the company’s compliance with rules and policies adopted in applicable proceedings; and (ii) the company’s commitment to coordinate physical operations of its satellites in good faith with both current satellite operators, such as Spire, and current and future applicants proposing to operate in the 400-600 km orbital altitude range.<sup>9</sup> Such a requirement would ensure the continued ability for Spire and others to have fair and reasonable access to a critical shared orbital resource. As part of the good faith requirement, SpaceX should be required to take active responsibility for collision avoidance during orbit raising and end-of-life de-orbiting through low-Earth orbit. Further, SpaceX should not be permitted to request that other parties assume the full burden of avoiding collision with SpaceX’s 1,540 satellites.<sup>10</sup> Without such constraints, SpaceX could effectively unilaterally determine which systems can operate in the 400-600 km orbital altitude range.

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comment on whether the Department of Commerce and the National Oceanic and Atmospheric Administration should establish debris mitigation requirements).

<sup>9</sup> See, e.g., *Space Exploration Holdings, LLC, Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion, Order, and Authorization, 33 FCC Rcd 3391, 3396 ¶ 11 (2018) (requiring SpaceX to “coordinate its physical operations with space stations of NGSO systems operating at similar orbital altitudes”); *Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, Order and Declaratory Ruling, 32 FCC Rcd 5366, 5378 ¶ 25(d) (2017) (requiring OneWeb to “coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts”).

<sup>10</sup> See CSSMA Comments, Technical Annex, at Section B.

For all of the above reasons and those stated in the CSSMA Comments, Spire urges the Bureau to defer action on the the SpaceX Modification or, in the alternative, impose conditions on any grant of the SpaceX Modification.

Respectfully submitted,

/s/ George John

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**CERTIFICATE OF SERVICE**

I, Alex Orzulak, hereby certify that on January 29, 2019, a true and correct copy of this Petition to Defer was sent via U.S. Mail, first class postage prepaid, to the following:

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